

A New Species of *Cypraea* from Samoa in the *C. cribraria* complex

by

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Abstract. *Cypraea taitae*, the eighth member of the *C. cribraria* complex of cowries, is described as a new species on the basis of conchological and external anatomical features which differ from those in *C. astaryi* Schilder, 1971, a close conchological relative, and from all others in the *C. cribraria* species complex. *Cypraea fallax* Smith, 1880, and *C. bernardi* Richard, 1974, are not considered members of the *C. cribraria* species complex.

Cypraea taitae Burgess, sp. nov.

(Figures 1-4, 8, 10)

Description: Shell: Cypraeiform, elongate-ovoid, moderately small, 10-17 mm, with produced extremities. Labial callus prominent; slightly umbilicated. Anterior extremity prominent and pointing upward in two of the five paratypes. Columellar teeth fine, sharply cut, confined to aperture. Labial teeth slightly coarser, produced to cross about one-third of the base. Aperture narrow, curved toward the columellar lip. Fossula vertical, prominently ribbed with six denticles but without a sulcus. Dorsum gold colored with discrete white spots; mantle line definite and discrete. Spire pure white but dorsal pigment may encroach. Discrete brown to black spots (0.3 × 0.7 mm) confined to the top of the labial callus and not appearing to ascend onto dorsum; spots not always visible on lateral margin of labial base. Columella with similar spots confined almost always to lateral margins of white base.

Animal characters: Mantle brilliant dark carmine, thin, not obscuring dorsal pattern. Papillae fingerlike, blunt, arising from circular area of discrete black dots. Other papillae prominent, widely spaced, resembling three or four beads on a string, decreasing in size from their bases. Some papillae white, bearing several tufts arising from terminal bead, forming two vertical rows equally spaced along full length of mantle. Siphon carmine, finely fringed with short processes shaped exactly like interstices between them. Tentacles darker carmine, clubbed, with still darker tips. Foot of same color as mantle, studded, as is mantle, with discrete black spots; crawling surface pale orange.

Habitat: Three live specimens were collected by the author in 1965, near Lepua Village, Pago Pago, Tutuila, Amer-

ican Samoa, on the north side of the harbor on the reef flat; the cowries were under large coral blocks at a depth of 1-3 m at low tide near the drop-off into deep water. Additional specimens were collected from the same area by Bob Purtymun (personal communication, 1977) who also found subfossil shells in Pago Pago Harbor dredgings at Aua. In Western Samoa, Terry Kurth (personal communication, 1975) collected three pairs, each of one large and one small specimen, at 7.6 m in a current-swept gap in the reef under small coral slabs.

Measurements: See Table 1.

Type locality: The reef near the village of Lepua directly across Pago Pago Harbor from the city, Tutuila, American Samoa, 140°W, 19°6'S.

Range: American Samoa (C. M. Burgess & R. Purtymun, personal communication, 1977); Western Samoa (T. Kurth, personal communication, 1983); Fiji (CERNOHORSKY, 1965, non *C. gaskoini*); New Hebrides (now Vanuatu) (SCHILDER & CERNOHORSKY, 1967; DEBANT 1969, non *C. fischeri* Vayssière, 1910).

Type depository: The holotype, length 16.2 mm, width 9.4 mm, is deposited in the Bernice P. Bishop Museum, Honolulu, Hawaii, BPBM 9966. Paratypes "a" and "b" (Figure 1) are in the Purtymun collection, 1200 Brickyard Way, No. 407, Point Richmond, California 94801; paratypes "c" and "e" (Figure 1) are in the Burgess collection, 2502 Manoa Road, Honolulu, Hawaii 96822; paratype "d" is in the McKinsey collection, 95-016 Kipapa Drive, Miliolani, Hawaii 96789.

Etymology: This species is named for my wife, Grace Tait Burgess, whose love and willingness to continue to



Explanation of Figures 1 to 10

Figures 1-4. Dorsal, right and left lateral, and ventral views of the holotype of *Cypraea taitae*. BPBM 9966. Produced extremities are clearly illustrated. 16.2 × 9.4 mm. Photo by O. Schoenberg-Dole. ×1.25

Figures 5-7. Dorsal, right lateral, and ventral views of the holotype of *C. astaryi*. 16.6 mm. Photos by E. Alison Kay. ×1.25

Figures 8, 9. Spire views of the holotype of *C. taitae* (Figure 8), and a homeotype of *C. astaryi* from the Tuamotu Archipelago (Figure 9). Pigmented spire clearly illustrated. Photos by O. Schoenberg-Dole. ×1.25

Figure 10. Left lateral views of the five paratypes of *C. taitae*. a. length 17.0, width 9.8 mm; b. length 15.8, width 8.8 mm; c. length 13.6, width 7.7 mm; d. length 10.7, width 5.7 mm; e. length 9.8, width 5.10 mm. Photos by O. Schoenberg-Dole. ×1.25

Table 1
Cypraea taitae. Measurements and ratios.

Depository	Catalogue number	Locality	Length (mm)	Width (mm)	Height (mm)	L/W ratio	L/H ratio	Labial teeth	Columellar teeth
Bishop Museum	BPBM 9966 (Burgess 756-1) holotype	Lepua, American Samoa	16.2	9.4	7.1	1.72	2.28	16	22
Purtymun	10003 paratype a	Aua, American Samoa	17.0	9.8	7.5	1.73	2.27	18	27
Purtymun	10002 paratype b	Lepua, American Samoa	15.8	8.8	6.9	1.79	2.29	17	23
Burgess	756-2 paratype c	Lepua, American Samoa	13.6	7.7	6	1.77	2.27	15	20
McKinsey	FO16A4 paratype d	Taama Bank, American Samoa	10.7	5.7	5	1.88	2.14	16	19
Burgess	756-3 paratype e	Asau, Western Samoa	9.8	5.1	4.4	1.92	2.23	15	18
Average			13.85	7.75	6.15	1.8	2.25	16.1	21.5

type and retype unfamiliar words and names over almost a lifetime built a debt that I can never repay.

Comparisons: *Cypraea taitae* is the eighth member of the *C. cribraria* group, species of which are characterized by their orange to reddish dorsal pigmentation. Shells of *C. taitae* are easily separated from all others in the complex, and differ from those of *C. cribraria* Linnaeus, 1758, *C. cribellum*, Gaskoin 1849, and *C. catholicorum* Schilder & Schilder, 1938, by the presence of prominent discrete brown to black spots on the columellar and labial margins. Occasional small pigmented blotches or a few tiny light brown flecks may be present on the shells of each of these three species, but cannot be confused with the prominent spotting of *C. taitae*. The shells of *C. gaskoini* Reeve, 1846, differ from those of *C. taitae* in that they are globose; also, the marginal spots are smaller and in fully adult specimens may cover much of the dorsum of the shell. The shells of *C. esontropia* Duclos, 1833, are larger (14–34.7 mm) and more globose than those of *C. taitae*, the dark-banded embryonal structure is visible through the larger dorsal spots, and the teeth are much coarser than those in *C. taitae*. In *C. cumingii* Sowerby, 1832, the teeth are much finer and the terminal margin of the anterior lip is concave and sharper than in *C. taitae*.

Conchologically, shells of *Cypraea taitae* are most like those of *C. astaryi* (Schilder, 1971) (Figures 5–7, 9) but they differ in several respects. The anterior extremity of *C. taitae* is produced to the point where it is actually directed upward and extends from the shell to a prominent degree, and to a greater degree in two of the five paratypes. The shallow umbilicus of *C. taitae* is pure white and is without pigment except for the slight encroachment of the dorsal pattern; the umbilicus of *C. astaryi* is a narrow but deep, pigmented pit. The posterior extremity of *C. taitae*

is prominent but not so prominent as is the anterior extremity; the anterior extremity of *C. astaryi* is barely visible and in most specimens blends smoothly with the curve of the dorsum, a difference clearly seen in lateral views of both cowries. The shells of *C. taitae* are slender; those of *C. astaryi* (in all 17 specimens studied) are plump and loaf-shaped. The dorsal spots of *C. taitae* are rarely (one of six of the type lot) rimmed with a barely visible darker pigment ring which is a prominent character of *C. astaryi*. The teeth of both species are similar in number and appearance. In *C. astaryi* the fossula is grooved and grossly ridged; in *C. taitae* it is shallow and receding. The shells in both species have prominent marginal spotting but in *C. astaryi* it is more profuse and the spots are larger and often more heavily pigmented. Only the edges of the labial basilar spots of *C. taitae* are visible on the extreme lateral margins; the spots in *C. astaryi* are prominent and cover a portion of the base.

The mantle characters in *Cypraea taitae* are also very distinctive; indeed, it is the only member of the *C. cribraria* species complex that has tufted papillae. The mantle is also distinguished from that in *C. astaryi* by the papillar arrangement and by the discrete black spots which stud it and the foot. Neither tufted papillae nor the spots are present on the mantle of *C. astaryi* (see Busson's photograph of the mantle of *C. astaryi* in BURGESS (1985:250).

Discussion and History

From 1965 to 1985, references to *Cypraea astaryi*, *C. gaskoini*, and *C. fischeri* have been utterly confused. In 1986 André Lefait of Papeete, Tahiti, sent me a number of cowries from the Marquesas Islands and the Tuamotu Archipelago that did not fit any of the descriptions of shells in the *C. cribraria* species-complex. Comparison with the

holotype of *C. astaryi*, however, showed that they were conspecific with that species. Similarly, comparison of the type of *C. fischeri* with an array of shells in the *C. cribraria* species-complex showed that it was conspecific with *C. gaskoini*. These determinations left the shells described here as *C. taitae* without a name, a circumstance now rectified.

There are also some previously published figures both of shells and animals of *Cypraea taitae* which were ascribed to other species. These references include those of CERNOHORSKY (1965:3, figs. 1-4) who cites the shells as *C. gaskoini* from Fiji; SCHILDER & CERNOHORSKY (1967: 6, figs. 2, 3) who cites the shells as *C. cumingii* from the New Hebrides; DEBANT (1969:6, fig. 1a, b) who also refers his shells to *C. cumingii* from the New Hebrides; BURGESS (1977: 2, unnumbered text figures); and BURGESS (1985: 250, unnumbered figure) who refers his illustrations and animal description to *C. astaryi*. BURGESS (1985) was not aware that his Samoan *Cypraea* species was specifically different from *C. astaryi* and the illustrations of the dorsal and ventral views of what was then thought to represent that species are those of *C. taitae*; the photograph of the animal is, however, that of *C. astaryi*.

Two additional species have been suggested as members of the *Cypraea cribraria* species-complex: *C. fallax* Smith, 1880 (see LORENZ & BIRAGHI, 1986) (= *Cribraria haddnighiae* Trenberth, 1973) and *C. bernardi* Richard, 1974. Both conchological and mantle characters suggest that they are members of a group of *Cypraea* other than that of the *C. cribraria* species-complex. The shells of *C. fallax* reported from Denmark Beach, near Albany, Western Australia (BURGESS, 1985), superficially resemble those of *C. cribraria*, but the dorsal spotting is not depressed as in the shells of *C. cribraria* and others in the complex (the depression is formed by a lack of deposition of the dorsal pigment). The spots are more variable in size, the teeth on the columella are more produced, the fossula is of a different type (consisting of a very prominent and grossly ridged structure), the mantle obscures the dorsal pattern, and the thick conical papillae on the mantle differ from the slender, sometimes tufted, beaded papillae in the *C. cribraria* species-complex. The shells of *C. bernardi* Richard, 1974, from Hitiaa, Tahiti similarly lack the depressed dorsal spotting in the *C. cribraria* species-complex; the spots are more variable in size, the labial and columellar teeth are much heavier than they are in shells of other species in the complex, and the mantle is yellow-brown with thick fingerlike papillae with blunt white tips.

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LITERATURE CITED

- BURGESS, C. M. 1974. A new cowry of the *Cribraria* group. Hawaiian Shell News 22(6), New Series (174):1, 4.
- BURGESS, C. M. 1977. The "new" cowries. Hawaiian Shell News 25(12), New Series (216):1-6, 8.
- BURGESS, C. M. 1985. Cowries of the World. Gordon Verhoef Seacomber Publications: Capetown, South Africa. xiv + 289 pp.
- CERNOHORSKY, W. 1965. A new geographical record from Fiji. Hawaiian Shell News 13(11), New Series (69):3.
- DEBANT, P. 1969. Observations on *Cribraria fischeri*, Vayssière 1910. Hawaiian Shell News 17(10), New Series (118):6-7.
- DUCLOS, P. L. 1833. In: Guerin-Meneville. A description of *Cypraea esontropia*. Magasin de Zoologie 3rd year. 37 pp., pls. 19-37.
- GASKOIN, J. S. 1849. Description of seven new species of *Margarella* and two of *Cypraea*. Proceedings of the Zoological Society of London 17:17-23.
- LINNAEUS, CARL VON. 1758. Systema naturae per regna tria naturae. Editio decima reformata. Stockholm, Vol. Regnum Animale. 824 pp.
- LORENZ, F., JR. & G. BIRAGHI. 1986. A taxonomical revision of West Australian *Cribrarulae*. La Conchiglia 18(204-205): 24-26.
- REEVE, L. 1846. Description of two new species of *Cypraea*. Proceedings of the Zoological Society of London 14:23.
- RICHARD, C. 1974. *Adusta (Cribraria) bernardi*, sp. n. (Mesogastropoda, Cypraeidae) des Iles de la Societe et les porcelaines des Polynesie Francaise. Bulletin de la Societe des Etudes Oceaniennes (Polynesie Orientale) 16(1):377-383.
- SCHILDER, F. A. 1971. Zur Kenntnis der Cypraeidae 14. Eine neue *Cribrarula*. Archiv für Molluskenkunde 101(5/6):297-299.
- SCHILDER, F. A. & W. CERNOHORSKY. 1967. Rediscovery of *Cribraria fischeri* Vayssière. Hawaiian Shell News 15(3), New Series (86):5-6.
- SCHILDER, F. A. & M. SCHILDER. 1938. Description of two new cowries. Proceedings of the Malacological Society of London 23(3):114-115.
- SMITH, E. A. 1880. Descriptions of two new species of shells. Annals and Magazine of Natural History, Ser. 5, 8:441-442.
- SOWERBY, G. B., II. 1832. A catalogue of the Recent species of Cypraeidae. The Conchological Illustrations. London. 18 pp., 180 figs., 37 pls.
- TRENBERTH, P. 1973. A new subspecies of the species *Cribraria* Linnaeus, 1758. *Cribraria haddnighiae* from southwestern Australia. Malacological Society of South Australia 17:1.
- VAYSSIÈRE, A. 1910. Nouvelle étude sur les coquilles de quelque *Cypraea*. Journal de Conchyliologie 58:301-311.